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A PEER-MEDIATED SOCIAL NETWORK INTERVENTION TO ENHANCE THE SOCIAL INTEGRATION OF PERSONS WITH MODERATE AND SEVERE DISABILITIES

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Increasingly, parents, teachers, and students with disabilities are advocating for interventions that go beyond skill training to provide support for participation in integrated environments and support for friendships. The present research demonstrated a social network intervention for youths with moderate and severe disabilities. Two groups of nondisabled peers were recruited to participate in weekly discussions with an adult integration facilitator to increase opportunities for social interaction for 2 students (1 with autism and 1 who was moderately mentally retarded). The groups met to discuss social interactions that had occurred with the students with disabilities and to talk about strategies to promote greater inclusion of the students into ongoing social interaction. The nondisabled students participated in the design and implementation of social skills interventions during transition times and lunch. The nondisabled students used self-monitoring data sheets to record the quantity and quality of interactions. The frequency of interaction, number of opportunities for interaction, and appropriateness of social interactions were analyzed with a multiple baseline design. Results indicated that the social network intervention was successful in increasing the quantity and quality of interactions and that the network strategy promoted the development of friendships. The results are discussed in terms of the need for additional research showing the relationships between increases in social competence, peer-mediated intervention, and the development and support of friendship.

DESCRIPTORS: friendship, peer groups, severely handicapped, social support

The frequency of social interactions between students with disabilities and their nondisabled peers is one of the most frequently employed operational definitions of integration (e.g., Brinker & Thorpe, 1986). A quantitative measure (e.g., frequency of interaction) has many desirable features including precision of measurement, replicability across contexts, and desirable scaling properties. However, the definition of social integration also carries with it other more implicit assumptions concerning the qualitative nature of social interaction. Increasingly, the establishment of friendships between students with disabilities and their nondisabled peers is becoming one of the most important outcomes sought by school integration efforts (Haring & Breen, 1989; Sailor et al., 1989; Strully & Strully, 1985). Increases in single behavioral measures such as the frequency of interactions, initiations, or social responses, although important in helping to determine levels of social competence and refining specific social skill training packages, may or may not correlate with an increase in friendship relationships (Meyer & Putnam, 1988; Stainback & Stainback, 1987). Social integration, which by definition includes a focus on supporting friendships, must therefore be concerned with the manipulation and measurement of more complex interrelated contex-

We dedicate this research to the memory of our advisor and mentor Robert Gaylord-Ross. Robert's vision of people with disabilities in the mainstream of life was defined by the central criterion that such participation enhances quality of life through social inclusion.

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tual variables, including social competence, social support, antecedent contextual conditions, and interpersonal characteristics (Chadsey-Rusch, 1986; Haring & Breen, 1989; Haring & Lovinger, 1989; Koegel, Dyer, & Bell, 1987; Peck, Donaldson, & Pezzoli, 1990).

Much of the past research in the area of social integration has investigated the effects of social skills training at the level of the dyad. Peer-mediated strategies have been used to increase the rate of social interaction directly by reinforcing and prompting a nondisabled peer to initiate interactions or shape the social responding of a student with disabilities (Odom, Hoyson, Jamieson, & Strain, 1985; Strain & Odom, 1986). Student-mediated strategies have focused on teaching a student with disabilities to initiate and engage in interactions with nondisabled peers (Breen, Haring, Pitts-Conway, & Gaylord-Ross, 1985; Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984; Haring & Lovinger, 1989; Hunt, Alwell, & Goetz, 1988). Adult-mediated interventions prompt and reinforce the ongoing social exchanges of a dyad (Apolloni & Cooke, 1979; Russo & Koegel, 1977; Strain & Timm, 1974). Although this research demonstrates the progressive refinement of intervention strategies, there has been relatively little focus on the relation between increasing the rates of social interaction and the formation of relationships.

Among adolescents in school settings, most naturally occurring social interactions occur in group contexts. Much of the existing social interaction literature demonstrates the use of social skills within a context (dyadic interaction) that does not correspond to natural friendship interactions in the schools. The present research assessed whether an intervention that included multiple peers without disabilities facilitated increases in verbal and nonverbal interactions, the inclusion of a student with disabilities in a stable social group, and the emergence of friendships with peer network members.

This intervention is based on the operation of support groups to motivate and maintain behavior and attitude change. In the area of support groups for people with disabilities, the work of Forest (1987) is particularly noteworthy. Forest used a strategy based on counseling support groups to build more cohesive support for individuals with disabilities by including people significant to the individual at home, at school, and in the community, such as relatives, professionals, and friends. Forest facilitated the formation of "circles of friends" by having regular meetings in which group members discussed support needs and accomplishments of the person with disabilities. Reports from case studies and other anecdotal reports documented remarkable changes in quality of life, active participation in school activities, and increases in friendships as a result of formation of support groups.

The present research was designed to validate the effectiveness of a behavioral social support network strategy. The strategy developed in our research enlists groups of same-aged nondisabled peers to provide ongoing social support throughout the school day, with the goal being to integrate more fully (as measured by greater participation and acceptance) individuals with disabilities into the social life of their school. As with Forest's "circles," our peer networks met regularly (once per week) to solve problems, support, advocate, and develop strategies for achieving the specific objectives of the group. In addition, the peer networks provide ongoing empirical data regarding the success of their participation by teaching these nondisabled peers to monitor their interactions with the student with disabilities in their network.

In summary, the present study attempted to validate (a) the development of peer support networks within general education settings, (b) the effects of a peer network intervention on the social interactions of students with disabilities, and (c) the effects on peer satisfaction, attitude, and friendship development following involvement in a peer support network.

METHOD

Participants

Students with disabilities. Two youths with moderate and severe disabilities participated in the investigation. They attended a public junior high

school and received educational services in classrooms for students with moderate and severe disabilities. Both participants were mainstreamed into one general education class for 50 min per day and participated in all integrated nonstructured school activities (e.g., breaks between classes, lunch, and school assemblies). The classroom teachers identified the students as having few appropriate interactions with nondisabled peers during these nonstructured periods of the school day, no consistently identifiable nondisabled friends, and as being in need of systematic social skills training.

Chris, 13 years old, was enrolled in the school's eighth grade band class. Chris had previously received a diagnosis of autism. He displayed high rates of repetitive verbal and motor behavior and responded to changes in schedule, high task difficulty, and adult verbal corrections by engaging in noncompliant behavior, negative repetitive verbal statements, and inappropriate physical contact. Chris responded accurately to two-step spoken and written instructions and responded appropriately to social initiations from adults and peers approximately 50% of the time with one- to five-word statements. Chris rarely initiated social contacts with adults or peers. Approximately 95% of Chris' social initiations made toward peers were judged as inappropriate by adult observers and peers to whom initiations were directed. The Vineland Adaptive Behavior Scales yielded a composite score of 45, with a standard score of 59 in the socialization subdomain.

Pedro, 13 years old, was enrolled in a general physical education class attended by nondisabled eighth graders. Pedro was diagnosed as having moderate mental retardation and severe language delay. He displayed high rates of repetitive behavior, including jumping, hand flapping, and darting. Pedro typically responded to social initiations by peers and adults by covering his head with his hands. Pedro accurately followed approximately five one-step spoken directions in English and 10 one-step spoken directions in Spanish. He accurately responded to yes/no questions about 70% of the time, and with prompting he responded to open-ended questions with one- or two-word utterances. The Vineland Adaptive Behavior Scales yielded a composite standard score of 45, with a standard score of 54 in the socialization subdomain.

Recruiting nondisabled peer support networks. Special education faculty assisted in the initial recruitment of 1 or 2 nondisabled peers who had some prior contact with the students with disabilities. Group members were selected based on the following criteria: (a) having a mainstreamed class together, (b) sharing an on-campus job, (c) having a common interest (e.g., sports), (d) sharing a hobby (e.g., playing music), (e) having a prior acquaintanceship, or (f) an expressed interest by the student with disabilities. Once 1 or 2 students were identified, a meeting was arranged and the purpose and operation of the peer support network was explained to them. After the peers and the target student expressed an interest in participating, we asked the peers to recruit 2 to 4 close friends to participate. Participation was purely voluntary, and the students were aware that they could stop participating at any time. Throughout the investigation, the peers and the target students were given opportunities to withdraw from participation. Table 1 provides an outline of the introductory meeting delivered to both peer support networks.

Chris' group included 4 nondisabled peers (2 males and 2 females, ages 12 and 13). The 2 girls were in Chris' band class. All 3 played the trumpet and sat side by side. Prior to the investigation, 1 of the girls provided Chris with ongoing instructional support (prompts to read the music, to begin and cease playing, and to listen to the instructor), but they were rarely seen engaged in social interaction, other than greeting and saying goodbye, either in or out of class. The other girl similarly greeted and said goodbye to Chris in class, but engaged in no other social interaction with him. These 2 girls asked 2 nondisabled male friends to participate in the peer network. They knew who Chris was, but had never interacted with him. Three of the 4 peers were highly interested in music. The girls were honors students and were active in performance activities at school. The boys were average students, receiving mostly B and C grades in coursework.

Five male students (all age 13) participated in the social support network for Pedro. One was

Table 1
Peer Network Introduction

A. What?
Have a group of students who are already friends include a new person into their social clique.

B. Why?
1. Quality of life.
2. Teach skills through modeling.
3. School inclusion.
4. Disability awareness.
5. Value of a new member in the clique.

C. Why us?
1. Common interests.
2. Common classes.

D. Who?
1. Student.
2. Four or five nondisabled peers.
3. Adult facilitator.
4. Classroom teacher.

E. How?
1. Map student and peer schedules.
2. Assign times to hang out together.
3. Include student in normal routine.
4. Group decide what and how to teach.
5. Take data.

F. When?
1. During assigned time per day.
2. Whenever you feel like it.
3. During group meeting one lunch period per week.

G. Committment
From peers:
1. This as a good thing for each peer.
2. This as a good thing for the group.
3. Include student as a friend.
4. Attend weekly group meetings.
5. Be open and honest.
6. Take data.

From adults:
1. Maintain peer routines.
2. Develop interaction schedules.
3. Provide all written information.
4. Be sensitive to peer feedback.
5. Teach skills as needed.
6. Use peer suggestions.
7. Be responsive to peer comments.

enrolled in Pedro's physical education class, and they occasionally participated on the same team during team activities. Other than this shared participation, this student had few interactions with Pedro during class or at any other time during the school day. The 2nd peer in Pedro's network was enrolled in a peer tutoring program in Pedro's special education class for one 50-min period per day. His interactions with Pedro in the classroom were primarily tutorial. The only social exchanges observed were greetings and partings. Pedro expressed an interest in developing a friendship with this peer. These 2 boys were close mutual friends and recruited 3 additional friends who expressed an interest in supporting Pedro. Although these 3 peers knew who Pedro was, they had had no prior interaction with him. All of the participants in this network, including Pedro, were highly interested in sports and sports-related topics. The 5 peers were average students, receiving mostly B and C grades in coursework.

Settings and Materials

For both peer support networks, the 5-min transition period between each 50-min class and the 30-min lunch period were targeted for increasing interactions. It was during these times that nearly all unstructured social interaction occurred for students in this school. Interactions occurred in the hallways, in the locker areas, in the cafeteria, in open areas outside the cafeteria, and on the school field.

Group meetings with social network members were held in the special education classroom for 30 min once per week, with each network meeting on a different day of the week. Training of specific social skills for the student with disabilities was conducted by the peers between classes and at lunch, and by an instructor twice per week for 15 min in the special education classroom.

During group meetings, pizza and soda were provided by the adult facilitator. Each of the group members was provided with a student notebook containing an interaction schedule, weekly assignments, and daily data sheets. During each meeting, the set of completed data sheets was given to the group facilitator and a new set of blank data sheets was given to the peers.

Procedure

Baseline. Baseline data were collected prior to forming the groups. Each participant with disabilities was observed during all 5-min transition pe-

riods between classes and during lunch. An observer remained at a distance of 3 to 6 m from the student and attempted to remain inconspicuous, so as not to interfere with the ongoing interactions between students. During baseline sessions, no prompts, correction, feedback, or reinforcers were provided to the student or peers.

Implementation of peer networks. Each social network met once per week with the target student and an adult facilitator. An emphasis of the meetings was to allow and encourage peer-centered control and input and to minimize the adult role in terms of scheduling, generation of interaction strategies, and problem solving. The adult facilitator prompted, supported, reinforced, and focused the discussion when necessary. The ongoing format of the network meetings was to (a) assess anecdotally the previous week's interactions through an open discussion by the peers and student, (b) review and analyze the peer data regarding the assigned and independent interactions between the peer(s) and the student during the school day, (c) modify the interaction schedule as needed by peer written and spoken feedback, (d) discuss skill areas in need of peer and/or adult instructional support, (e) discuss strategies for social skills intervention as identified by the peers, (f) role play or model strategies to be applied, (g) seek solutions regarding specific problem interactions or behavior, (h) assess informally the satisfaction of group members regarding the network meetings and responsibilities, and (i) reinforce each member's participation through verbal praise, intermittent letters home, and occasional group social activities. During each meeting the types of themes routinely discussed and reinforced included the need for normalized interactions, friendship rather than helping relationships, consistency in responding or in interacting with the student, respect for the student's abilities, peer support, honesty, and the peers' ownership of the network.

The intervention consisted of the following phases:

Mapping schedules. The members were asked to write their daily class schedules, including the location of each class, and were asked to identify what they typically did between each class period. The daily class schedules of the students with disabilities were obtained from the classroom teacher. A schedule of interactions was then determined based on the presence of student and peer(s) in a common location during each transition period. Those transition periods that did not include a common presence remained unscheduled until the first network meeting.

Following the first meeting, measurement of student interactions was taken (still under baseline conditions). The peers were requested to continue their typical routine and behavior toward the student with disabilities until the group met the following week.

Provide the peers with interaction schedules, introduce the student to his network. During the second network meeting, the peers were provided with the schedule of assigned interactions. Each student was assigned one transition period per day in which to support the student with disabilities. For Chris' group, the girls hung out with Chris 2 days per week during the lunch break, and the boys hung out with Chris on the alternate 2 days. During the fifth lunch period of the week, the network met as a group. All of the members of Pedro's network ate together each day of the week. Although each peer was formally assigned one transition period in which to provide social support, they were free to hang out with the student as often as they wished. Modifications and additions were made to the interaction schedule as determined by the group members during the network meeting and as needed throughout the intervention. Each nondisabled peer was given a notebook that contained the modified interaction schedule and a set of daily peer data forms. The peers were taught to use the data forms and were provided with a rationale for peer rather than adult collection of data. On the data sheets, the peers indicated whether or not an interaction occurred during their assigned transition time and rated the appropriateness of the interactions that did occur (i.e., good, okay, or not good). In addition, there was a section to report and rate interactions that occurred beyond assigned times and places. The peers agreed to collect data during their scheduled interaction period and whenever they had an interaction with the student during

the school day. They also agreed to record any comments or suggestions related to their interactions or to the workings of the group.

The adult facilitator and the special education classroom teacher assumed responsibility for ensuring that the target student was in the right place during each transition period. During two 15-min periods per week, name-face correspondence training was conducted in the special education classroom. Photographs of the group members were arrayed on a table, and the target student was asked to point to the picture that corresponded to a spoken name and to say the name corresponding to the picture of the peer. No additional instructions, prompts, feedback, or reinforcement were provided to the student with disabilities during the transition periods. During this portion of the intervention, the reliability of peer-collected data was determined by an observer during each transition period and at lunch 2 days per week. Thus, if peers were not using the self-monitoring sheets correctly, they could be given immediate feedback.

Peer initiation and reinforcement of target students. During the third network meeting, strategies for initiating contact with the target student were discussed, including topics for age-appropriate interactions, strategies for establishing eye contact or appropriate physical proximity, and ways to include the student in larger group activities. If the teacher observed that an interaction between network members had occurred or if the student with disabilities reported that an interaction had occurred, the target student received social praise from the classroom teacher directly following the end of the transition period. After 2 weeks of consistent interactions, praise was reduced to every third transition period for 1 week, then to once per day. During the transition period itself, no prompts, cues, or feedback were given to the target student or to the peers. Once stability in the frequency of interactions was demonstrated and the network indicated a need for targeting student responding, the next phase of intervention was begun. If the students with disabilities did not respond to an initiation or responded inappropriately, the peers were told to ignore the inappropriate response and either continue walking with the student to their next class (if that was the predetermined goal of the transition) or continue to hang out with the student in the hall.

Peers prompt responding and adult teaches appropriate responses to target students. In the group meeting, a list of frequently used peer initiations and social topics was developed by the peers; from this list, a corresponding list of appropriate responses was developed. During two 15-min instructional periods per week, the initiation responses were used to teach a repertoire of social responses to the students with disabilities by the peer network facilitator. The instructional procedures used were the same as those employed by Haring, Roger, Lee, Breen, and Gaylord-Ross (1986). Briefly, the facilitator initiated an interaction, and the student was given 15 s to respond. When the student responded, the teacher judged whether or not the statement was contextually appropriate. If the student did not respond or produced an inappropriate statement, the teacher modeled a correct response. Contextually correct responses were praised.

During the group meetings, the peers developed strategies for facilitating student responses, including persistence in obtaining a response, modeling appropriate responses to the student, modifying the content or the structure of the initiation (e.g., ask who, what, where questions; avoid why questions), reestablishing joint attention, and increasing motivation to engage in social exchanges. As with all peer-mediated interventions, these strategies were implemented with a commitment to maintaining age-appropriate interactions. Intervention continued until stability in appropriate student responding was demonstrated.

Self-monitoring for Chris. The members of Chris' support network determined that their prompting of appropriate responses and the teacher training of social responses were insufficient to produce acceptable levels of appropriate social responding by Chris during interactions with the group members. The group determined that the failure to produce appropriate social responses was not related to a skill deficit, but to a lack of motivation.

Chris had previously received extensive training in self-monitoring of social responses in a clinic and a home setting, resulting in increased and consistent production of social responses in those setting. (Chris was a research participant in earlier research by Koegel & Koegel, 1990.) It was agreed that Chris should use this system at school. During all transition periods and at lunch, he wore a wrist counter, on which he depressed a counter each time he emitted an appropriate social response. Based on levels of typical frequencies of appropriate peer responses, Chris was required to produce 10 social responses during the 5-min transition period and 30 social responses during the 30-min lunch period.

Following each break from class, Chris entered the number of clicks showing on his watch for the appropriate time block on an index card mounted on his desk. If the criterion was met during the specific period, Chris self-delivered a piece of candy kept in a cupboard in the back of the classroom. During the break, members of the group ensured consistent and honest use of the counter by prompting him to depress the button whenever appropriate and prompting him to "fix" the counter whenever he attempted to depress the button noncontingently. After an increase to acceptable levels in social responding, the group decided to remove the counter and found that Chris continued to respond appropriately in its absence.

Maintenance conditions. Following attainment of peer group goals for student change, the extent of the peer network intervention was reduced for Chris such that (a) the peer participants were asked to discontinue data collection, (b) the classroom-based adult teaching of specific skills was discontinued, (c) the support meetings were reduced to one every 2 weeks, and (d) no additional peer group assignments were made by the network facilitator. The bimonthly network meetings focused on problem solving and supporting peer requests for more extended friendship interactions (e.g., getting together after school and on weekends, participating mutually in school-based extracurricular activities, such as marching in parades and performing in school concerts), rather than on those specific skills desired during ongoing interactions. Pedro was not exposed to maintenance conditions because the school year ended at the completion of intervention.

Measurement

Data were collected during the entire school day. Potentially, there were nine times during the day when data could be recorded: before school during the transition to first period class, five transition times between class, lunch, and transition after school to the bus area. Observers recorded the frequency of social interactions between peer participants and the student with disabilities, frequency of those interactions with appropriate social responding, and the identity of peers with whom interactions occurred. Two procedures were employed to gather data. Three days per week, the peers in the support network gathered data regarding their specific interactions with the student with disabilities. At least 1 day per week, the adult network facilitator independently recorded data. The major quantitative dependent variables were defined as follows:

Social interaction. A social interaction was any class of behavior that included at least one initiation followed by a response. An initiation was defined as any verbal or nonverbal response (such as handing an object) directed toward another individual. An instance of a social interaction was defined by the presence of 1 or more nondisabled peers, the students coming to within 1-m proximity of each other, a verbal or nonverbal initiation by either the peers or the student with disabilities, and a verbal or nonverbal response by either the peers or the student with disabilities. Multiple initiations by the same person during an interaction were not coded as additional social interactions; therefore, during a specific transition or lunch period, only one interaction was scored for each individual with whom an interaction occurred, regardless of the number of actual interactions that occurred within that specific dyad. Once an interaction occurred, a new interaction could be scored only if a new peer approached the target student (either alone, with a peer, or in a peer group), and an interaction was initiated by the student or peer. Prior to formation of the peer networks, interactions typically consisted of greeting responses (i.e., single-turn interactions)

emitted to target students as they walked down the hall. After introduction of the intervention, interactions typically consisted of the student with disabilities walking down the hall with a peer and exchanging social pleasantries or talking about school. Multiple-turn interactions were defined as including at least one response by the peer and the target student after the first initiation and response. Multiple-turn interactions were scored by the adult network facilitator during baseline and intervention phases to examine the impact of the intervention on the development of friendships that typically included both single- and multiple-turn interactions.

Appropriate social responding. An appropriate social response was a response that directly corresponded to the initiation in meaning and in tone. For example, an interaction of the following type was scored as appropriate:

A: Hi.
B: Hi.
A: Want to go to the library?
B: Yeah.
A: Great, let's go.
B: (walks next to peer)

In contrast, an interaction of the following type was scored as inappropriate social responding because of the lack of correspondence in meaning between the initiation and the response:

A: Hi.
B: Hi.
A: Want to go to the library?
B: Cheese, cheese, cheese.
A: Huh?
B: T.V. Guide.

Extended social interaction data. In addition to daily reports of school-based interactions, written records of the number of occasions in which an interaction occurred between peers and the student with disabilities outside of school was maintained by the adult facilitator. Instances of nonscheduled interactions were recorded after group meetings and through periodic phone contacts with parents.

Qualitative measures. Daily, the peers rated the quality of the interactions they had had with the student with disabilities. The students filled out this feedback directly on the daily peer data sheets (good, okay, or not good) by circling the appropriate indicator.

Before, during, and after the intervention, the peers were asked to rate their satisfaction with the program, their viewpoint on specific elements of the program, their attitude toward interacting with the student, and their relationship with the student. The students (a) rated the program in general (It's great; It's okay; I don't know; I'll do it if my friend does it), (b) described the student (He's just like anybody else; He's kind of weird; He's funny and he would be fun to hang around with; He's funny and it would be fun to make fun of him; He scares me; or He won't be able to learn anything from doing this), and (c) described their relationship with the student (I don't know who he is; I know who he is, but I don't know him; We have a class together, but I don't know him; I help him; We are friends; We are best friends). In addition, they rated specific aspects of the program on a 5-point Likert scale. These programmatic aspects included (a) what they were asked to do with the student, (b) being with the student with other group members present, (c) being with the student with disabilities when other students who are not group members were present, (d) how often group meetings were held, (e) the target student's social responses, (f) how often they hang out with the student, (g) and their overall satisfaction with the program.

Satisfaction of the student with disabilities was measured weekly immediately prior to the group meetings. The students were asked if they wanted to (a) come to the meeting and (b) continue to hang out with each of the peer network members during school.

In addition to this more formal qualitative feedback, the weekly meetings contained frequent discussions regarding the development of their ongoing relationship with the target student and their general satisfaction with their participation. The meetings were videotaped to provide additional anecdotal descriptions of the development of their relationships.

Interobserver Agreement

During interobserver agreement sessions, an observer remained at a distance of 3 to 6 m from the student and the peer(s) and recorded data independently of the primary observer. The point-by-point reliability formula (Kazdin, 1982) was used to calculate the percentages of agreements on occurrence.

Reliability of peer data. Seventy-six percent of the social interaction observation data was recorded by the peers. Interobserver reliability observations were conducted for 20% of the peer-collected data. The peer network facilitator conducted reliability sessions by observing the peers during natural transition times and at lunch. For the two groups of nondisabled peers, there was a mean of 87% agreement on the occurrence of interactions and 82% agreement regarding the occurrence of interactions with appropriate responding.

Reliability of observer data. Twenty-four percent of the reported data was collected by the peer network facilitator. A second observer recorded simultaneous interaction data on 20% of the sessions recorded by the primary observer. Agreement on the occurrence of interactions between group members was 95%, 100% on the occurrence of multiple- versus single-turn interactions, and 88% on the occurrence of interactions with appropriate responding.

Design

A multiple baseline design across participants was employed. After the demonstration of stable baseline responding across variables, the social network interactions were introduced for Chris. The social network interventions were then layered in for Pedro.

RESULTS

Social Interaction Data

Frequency of interaction. The frequency of interactions between network members is reported in Figure 1. The circles indicate the frequency of all (single- plus multiple-turn) interactions with group members. The squares indicate the frequency of multiple-turn interactions between group members. Following baseline (M = 1.2 interactions per day, no multiple-turn interactions), the group was formed and the network developed strategies for initiating interactions toward Chris. An increase in the number of interactions to a mean of 7.44 interactions per day was observed. Under maintenance conditions, the mean frequency of interactions with network members was 9.0 after 1 month and 7.0 after 2 months. During intervention and maintenance phases, all interactions recorded by the adult facilitator were multiple-turn interactions. For Pedro, the frequency of total interactions increased from a baseline mean of 2.6 to 8.03 interactions per day under treatment conditions. The frequency of multiple-turn interactions increased from baseline (0.89) to a mean of 7.25 interactions per day.

Appropriate responding by student with disabilities. Figure 2 shows the effects of peer network strategies on the frequency of interactions with appropriate responding for Chris and Pedro. Under baseline conditions, the mean frequency of appropriate responding by Chris was 0.25 (20% of the opportunities available) interactions containing appropriate responding per day. When the group was formed and the peers began initiating interactions, the mean frequency increased to 2.27 (39%) interactions per day. When the peers prompted more appropriate interaction, the frequency of appropriate interaction was 3.08 (38%), and when Chris self-monitored his social responding, the mean frequency of interactions containing appropriate responding was 6.6 (81%) interactions per day. Under maintenance conditions, the frequency of interactions with appropriate responding at the 1-month check was a mean of 7.77 and at the 2-month check, it was 7.0 (98%). Pedro's data indicate a mean of 1.78 interactions (69%) containing appropriate responding per day during baseline. The number of appropriate interactions increased to a mean of 3.9 (55%) when the group was formed and the students developed strategies to initiate interactions, and reached 6.8 interactions per day (78%) when the peers prompted appropriate social responding.

Nonstructured contexts containing interaction. During the first phase of intervention (i.e.,

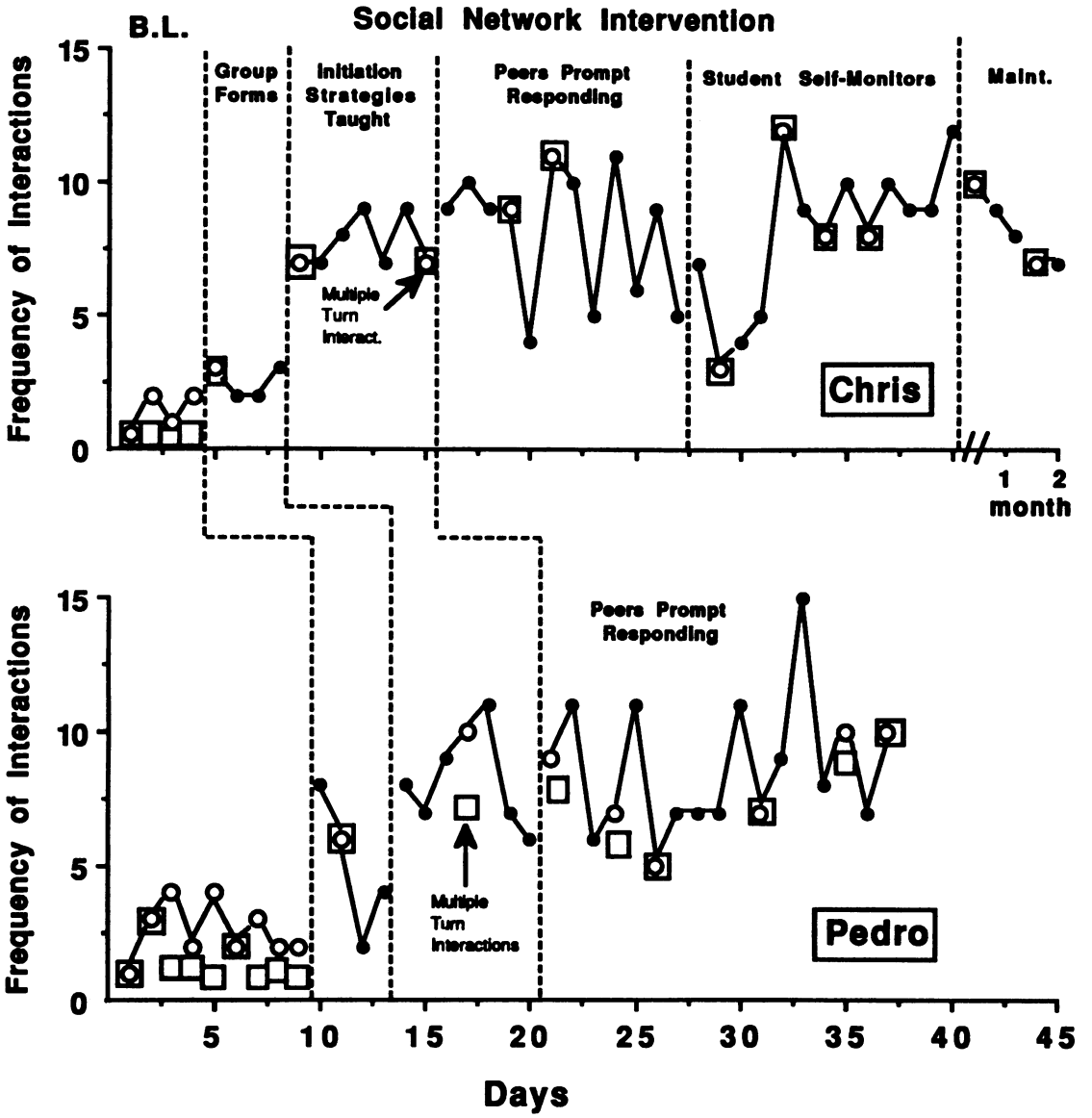

Figure 1. Frequency of interactions between peer network participants and students with disabilities as reported by the peers (closed circles) and the primary observer (open circles); and frequency of multiple-turn interactions (squares).

establishment of the group and a working interaction schedule), the percentage of transition periods in which the peer participants were present was 65% for Chris and 86% for Pedro, with 30% and 62% of the contexts, respectively, including interactions. For the remaining network intervention phases, network members were present during 85% of the contexts for Chris and 90% of the contexts for Pedro, and interactions occurred during 81% of the contexts for Chris and 88% of the contexts for Pedro.

Completion and extension of peer-assigned interactions. Across all phases, Chris' network members engaged in 83% of the assigned interactions. Of the total number of interactions that occurred after baseline (i.e., assigned plus self-initiated), 25% were not assigned but were initiated independently by the peers. For Pedro's peer network, the peers

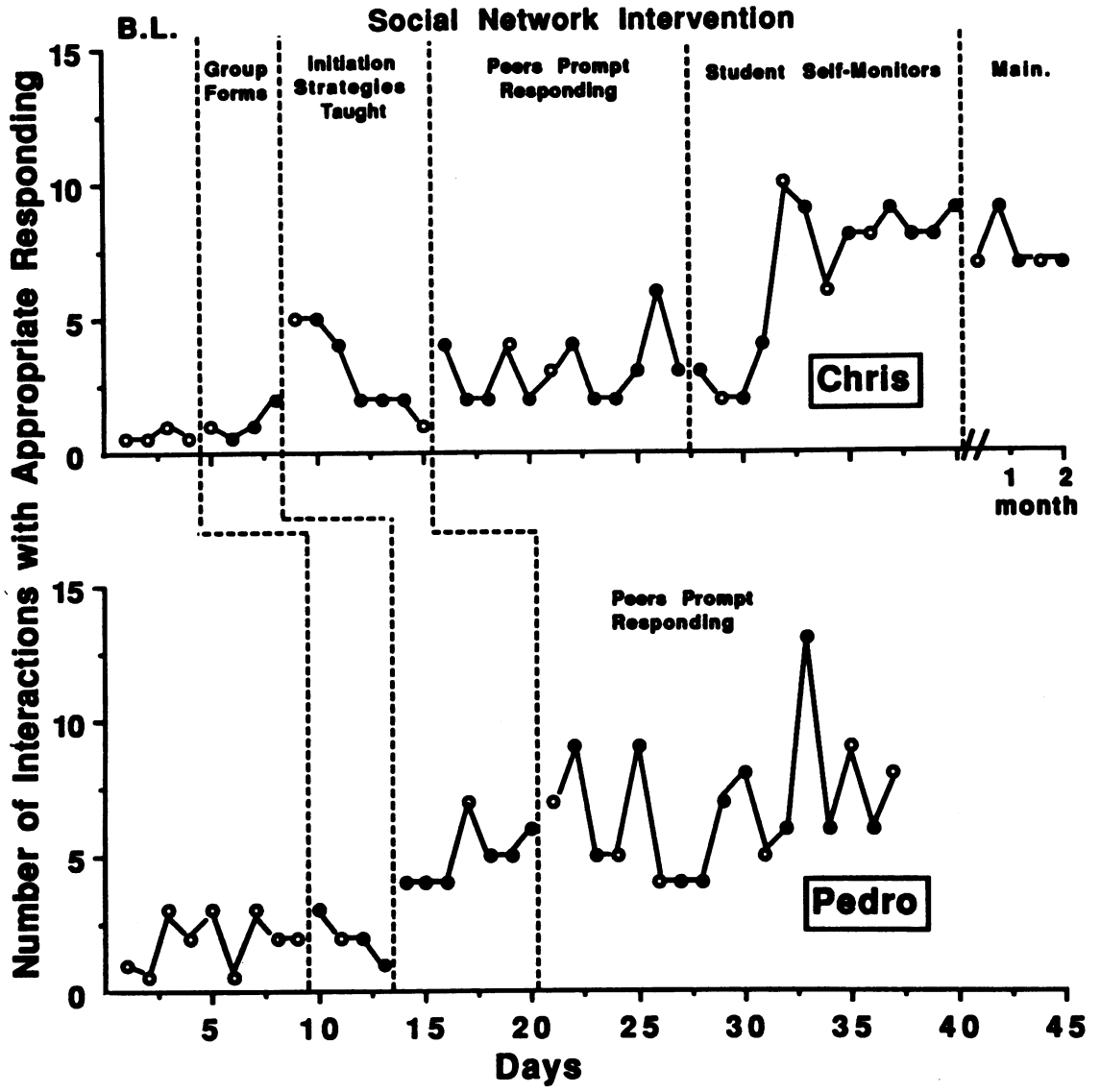

Figure 2. Frequency of interactions including appropriate responding by the student with disabilities as reported by the peers (closed circles) and the primary observer (open circles).

engaged in 88% of their assigned interactions and self-initiated 22% of the total.

It is important to note that for both target students, no interactions with peers occurred outside school during the baseline period. During intervention and maintenance phases for Chris, nonprompted interactions with peers occurred outside school on 12 occasions; for Pedro, these occurred on five occasions. These included trips to the beach on the weekend, eating dinner at another family's home, shopping trips to the mall, playing music together, and a trip to a nearby town. Chris' mother reported that this was the first time in Chris' life that he had been invited on such activities with same-age friends.

For Chris, the effects of his peer network extended to the next academic year. Chris' original group graduated to high school. Prior to grad-

uation, the members of the group recruited five of their friends to provide Chris with social support and a stable network of friends during the next academic year. Through the modeling of interactions between Chris and the original group members, the new group effectively stepped in to provide ongoing support to Chris in his mainstreamed class and during all nonstructured times of the school day.

Qualitative Data

Daily qualitative ratings of interactions. Peers were asked to rate the interactions using a Likert-type 3-point rating scale (1 = not good, 2 = okay, and 3 = good). Chris received a 1.8 during the first phase of intervention (recruit group, establish schedule), 2.03 during the peer-initiation phase, 2.2 during the phase in which peers prompted student responding, and 2.8 during the student self-monitoring of social responding (with an overall mean across all peer network interventions of 2.2). Pedro received a 2.25 during the first phase of intervention, 2.3 during the peer-initiation phase, and 2.6 during the phase in which the peers prompted the responding of the student with disabilities (with an overall mean across all peer network interventions of 2.4).

Periodic measures. Measures of peer satisfaction with program were taken during the first network meeting, 5 weeks into the intervention, and at the end of the intervention (10 to 12 weeks after baseline). When asked, "What do you think about the peer network program?" prior to intervention, 67% of the peer nominations reflected the response, "It's great," whereas during and after the intervention 100% gave the same response. Although the program overall received a mean rating of 5.0 (excellent), when the students were asked to rate various aspects of the program, five components (what's talked about in group meetings, being with the student when I am with people outside of the group, how often group meetings are held, the student's social responses, and how often I hang out with the student) were rated as below 4.0 (better than average) prior to intervention. During intervention three of the five components received mean ratings of greater than 4.0. Upon completion of the intervention, the mean rating of the components of the intervention was 4.6 (compared to 4.1 during the first group meeting).

Prior to intervention, 24% of the peers reported the target student as just like anybody else, 29% reported the student as funny and fun to hang around with. After intervention, a total of 78% of the descriptions were in these two categories. When asked to describe their relationship with the student prior to the intervention, 22% of the peers categorized the relationship as friends. After intervention, 89% categorized the relationship as friends and 11% as best friends. The comments made by the students throughout the intervention consistently centered on the development of a friendship with the target student.

Satisfaction measures of the students with disabilities indicated that the students elected to attend all of the network meetings and responded positively 100% of the time to opportunities to end or continue their interactions with peer network members during the school day. In addition, when asked intermittently who the peer network members were, the students typically said the peers were their friends.

Anecdotal evidence. Anecdotal reports from peers, parents of members with and without disabilities, and teachers indicated that the intervention was successful in facilitating the inclusion of Chris and Pedro into larger social groups made up of network members and their friends, the inclusion of the students in nontargeted contexts (e.g., activities after school and on weekends with group members), and the shaping of nontargeted social behavior (e.g., student initiations of social interaction with group members and peers outside of the group). Additionally, peers and their parents expressed, during and after intervention, the positive effects of their participation on their overall satisfaction with school life and feelings of school ownership.

DISCUSSION

A greater number of single- and multiple-turn interactions between members of a peer network and interactions with appropriate social responding

in nonstructured contexts across a school day were found for 2 students with disabilities following the establishment of a peer support network and peer-mediated intervention strategies. These results were accompanied by increased satisfaction of group members regarding specific program variables and improved attitudes and ratings of friendship toward a student with disabilities. The multiple baseline design showed the functional control of the intervention on increasing the frequency of social interaction, although no functional control was demonstrated for the frequency of interactions with appropriate responding. During the intervention, Chris and Pedro actively engaged in interactions with nondisabled peers within a cohesive network of nondisabled peers that comprised their peer support networks during most of the nonstructured contexts of the school day.

These data extend the literature on peer-mediated interventions for increasing social interaction by demonstrating the effectiveness of peer group mediation on the presence and maintenance of social interaction in contexts that lack ongoing adult prompting, reinforcement, or structure. Much of the prior literature demonstrated the acquisition of specific social skills or increased frequency of interaction in the presence of structured adult prompting or reinforcement, but has shown limited generalization to more natural contexts (e.g., Odom et al., 1985). These data suggest that by enlisting groups of peers to facilitate natural interaction, generalization and high levels of satisfaction may be found, perhaps due to increased group support.

Although the increase in frequency of social interaction and specific social behavior is a desirable outcome for integration programs, it is important to assess whether social skills outcomes are associated with friendship development. It is no longer sufficient to teach students to "engage in three or four conversational scripts with one or two nondisabled peers" and call our job done. We must look at the contexts in which those conversational scripts are being used and their contributions to the relationships between a target student and his or her nondisabled peers. Following involvement in a peer support network, the majority of peers in this investigation described their relationship with the target student as one of a friend. In both of the networks, peers initiated interactions that were not assigned by the adult facilitator or other members of the group, including hanging out with the student between classes during nonscheduled times and, at a higher level of commitment, hanging out with the student away from school, after school, or on weekends. Friendship is a term that is not easily defined; there exist multiple levels of relationships from acquaintances, to friendships, to best friends. The nomination of friendship relationships (as reflected in the Likert data and anecdotally during group meetings), the frequency of spontaneous, nondirected single- and multiple-turn interactions in novel contexts, and anecdotal reports from parents of both the studies with disabilities and the nondisabled peers provide evidence of the development of friendship as a result of participating in the program.

Breaks between classes and lunch periods in typical junior high schools naturally include a great number of ongoing opportunities for interaction with nondisabled peers (Haring et al., 1992); perhaps an equal number of programmatic headaches occur for teachers concerned with the teaching of social interaction. The programming of instruction in contexts in which stimulus and response demands are ever-changing is extremely difficult, particularly when constrained by the need for simultaneous supervision of many students and the desire to maintain an air of teacher unobtrusiveness. Therefore, although opportunities for interaction may be available during these times, the actual frequency of opportunities used (i.e., opportunities where interactions occur) is typically low (Haring et al., 1992). The use of peer support may be an efficient way to achieve more active participation of students with disabilities in nonstructured contexts with less need for ongoing adult support.

Within peer support networks, several variables come into play that may singularly or in combination contribute to the effectiveness of the program on social interaction and friendship development. Several areas should be explored further. First, peer ownership, leadership, problem solving, and strategy development were emphasized within the group meetings in contrast to more adult-centered me-

diation, perhaps contributing to (a) increased peer attempts to participate and contribute and (b) the occurrence of more typical ongoing age-appropriate interactions. Given greater peer control and peer interdependence and less reliance on adult-mediated interventions, stronger, more durable, and more typical friendships may have been facilitated. The role of transferring responsibility of social skills interventions from adult-controlled procedures to peer-controlled and -generated procedures warrants further investigation.

Second, the optimal number of peers and number of different extant social groups included in a peer support network are at present unknown. Chris was supported by 4 friends and Pedro by 5, and both networks were successful in obtaining its objectives. In general, the number of participants should depend on the number of members the specific group agrees to support while demonstrating ongoing high levels of satisfaction.

Finally, to formalize the interaction schedule and develop procedures, it may be necessary to meet as a group at least once per week (particularly when establishing the network). The schedule of group meetings after stability is shown in attainment of network objectives may depend on the needs and desires of the members. Whether the effects of the network can be maintained in the absence of at least intermittent group meetings or adult support is unclear at this point. Although an important goal of a peer network intervention is to include a student more fully into a stable group of friends with the intent that the friends provide the support for continued inclusion, it is unclear whether this necessitates the fading or eventual disbanding of the group meetings. Perhaps continuing the meetings intermittently and gradually eliminating the participation of the adult facilitator would be a more effective method for maintaining the inclusion of a student in a social group.

In summary, the present research served to extend the literature on peer support and friendship by providing a data-based demonstration of the integration of social skills instruction with a friendship support program. Social competence plays an important part in the habilitation, participation, and inclusion of individuals with disabilities. These data suggested that friendships can be developed while systematically increasing the social competence of individuals in natural contexts. The use of peers as mediators of social relationships, social support, and instructional support (both in and out of school) is a fast-growing area of research. Those specific variables that influence the effectiveness of peer network interventions and the application of such strategies remain to be explored.

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